AMENDMENT TO THE DRAWINGS

Please find enclosed replacement sheet showing proposed amendments to Fig. 3 for the approval of the Examiner.

Fig. 3 has been amended. The attached sheet of formal drawing replaces the original sheet including Fig. 3.

REMARKS/ARGUMENTS

Applicant responds herein to the Office Action dated August 5, 2005.

In the Office Action, specifically in paragraphs 1 through 6, the Examiner has objected to the manner in which the applicant has claimed that the instant application as a continuation application under 35 U.S.C. §120 of Japan PCT/JP02/04385 which filed May 2, 2002. Furthermore, in paragraph 8 of the Office Action, the Examiner has objected to the Declaration and has requested a newly submitted Declaration.

These issues were discussed between applicant's undersigned representative in at least one telephone conference with Examiner Constantine Hannaher, and at least two telephone conferences with the Examiner's Supervisor, Mr. David Porta. In fact, there was a third telephone message from Mr. Porta to the undersigned explicating the issues raised in these paragraphs. The net result of these discussions was that the applicant is being requested to amend the PrintEFS INVENTOR INFORMATION sheet so that it refers only to the PCT application and not to the two Japanese priority applications S.N. 2001-139136 and S.N. 2002-115399. A revised PrintEFS INVENTOR INFORMATION sheet is submitted herewith, which does not comport with the Patent Office's request, but which is nonetheless correct.

The undersigned was also directed to submit a new Declaration which does not list the aforementioned Japanese applications at page 2 thereof, which would allow the applicant to defeat any prior art which is later than September 5, 2001, which is the filing date of the first of the two Japanese home applications.

The applicant strongly traverses that request. It is respectfully submitted that the Declaration form submitted with this application has been used on numerous occasions by this law firm and other law firms without objection. The already submitted Declaration is correct and the request for a corrected Declaration is respectfully traversed.

In view of the foregoing remarks, the Examiner is respectfully requested to review, reconsider and rescind the requests in paragraphs 1-6 and 8 of the instant Office Action.

Responsive to the objection to the drawings, as set forth in paragraph 9 of the Office Action, it is stated that an irregularity exists in Figure 3 because "Switches 46a connected to the push pins 46c therefore remain off" is not shown as required by page 29. Reconsideration and withdrawal of this objection is requested in view of the amendments to Figure 3 herein.

Further in response to the Office Action, the reference to "a registered trademark" has been omitted from page 93. Still further, and in response to the claim rejections under 35 U.S.C. §112 as set forth in paragraphs 12-13 of the Office Action, the claims have been amended responsive to said rejection and reconsideration and withdrawal thereof is respectfully requested.

Various claims in the application have been substantively rejected on prior art as set forth in paragraphs 15-21. However, claims 13, 7, 14, 20 and 26-28 and 29 have been indicated to be directed to patentable subject matter.

In response to the aforementioned assertions and finding in the Office Action, the applicant has rendered allowable claim 7 in independent form and requests formal allowance thereof. The remaining claims in the application are all dependent, directly or indirectly, from independent claims 1 and 2.

Relative to independent claims 1 and 2, it is respectfully noted that these claims recite that at least one of the focal range, the focal position and the numerical aperture of the optical probe are included in the characteristics of the optical probe. Support for this limitation is found in the specification, particularly at page 40, lines 10-17, where it is described that the numerical aperture and the focal position are related to each other. Also, as to the focal range (focal depth δ) and the numerical aperture (NA), it is noted that the relationship setting forth that $\delta = \pm \lambda/NA$, is described in the *Handbook of Optics*, p.1.9 and p.1.39, a copy of which pages are attached to the instant amendment. Insofar as the focal range and the focal point are included in the characteristics of the optical probe, the applicant deems it eminently clear to one of ordinary skill in the art that the numerical aperture is also included in the characteristics of the optical probe.

With the foregoing in mind, it is noted that in Ozawa (6,069,698) is disclosed an optical imaging apparatus which teaches, in col. 4, lines 4-15 thereof, to replace the optical probes 8 of different length and the necessity to adjust the length of the optical path in compliance therewith. In other words, this reference teaches and discloses utilizing the "length of the optical probe" as a characteristic of the optical probe. However, Ozawa fails to disclose or suggest the focal range of the optical probe, its focal position, and its numerical aperture as being provided for selection from thereamong as the characteristic of the optical probe.

In the other cited reference, namely Abe, et. al. (6,903,761), there is also disclosed an arrangement that reads information from a ROM 16 of the electronic scope 10. However, this

information is in the form of an electrical signal, as described at col. 2, lines 50-52 thereof. Hence, Abe, et. al. also fails to disclose or suggest that focal range, a focal position and a numerical aperture as being the characteristics of the optical probe.

Inasmuch as neither Ozawa nor Abe, et. al. disclose or suggest the focal range, the focal position and the numerical aperture as characteristics of the optical probe, these references cannot be deemed to suggest any of the inventions of the present invention.

The foregoing remarks are fully applicable to claim 2 and therefore, to all of the remaining claims in application which are all (except claim 7) directly or indirectly dependent on claims 1 or 2, whose allowability has clearly been established above.

Accordingly, the Examiner is respectfully requested to reconsider the application, allow the claims as amended and pass this case to issue.

Respectfully submitted,

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If the lens system is diffraction-limited, then the depth of focus according to the Rayleigh criterion is given by

$$\delta = \pm \frac{\lambda}{2n_i \sin^2 u_i} \tag{54}$$

Diffraction-Limited Lenses

It is well known that the shape of the image irradiance of an incoherent, monochromatic point-source formed by an aberration-free, circularly-symmetric lens system is described by the Airy function

$$E(r) = C_0 \left[\frac{2J_1(kD_{ep}r/2)}{kD_{ep}r} \right]^2 \tag{55}$$

where J_1 is the first order Bessel function of the first kind, D_{ep} is the diameter of the entrance pupil, k is $2\pi/\lambda$, r is the radial distance from the center of the image to the
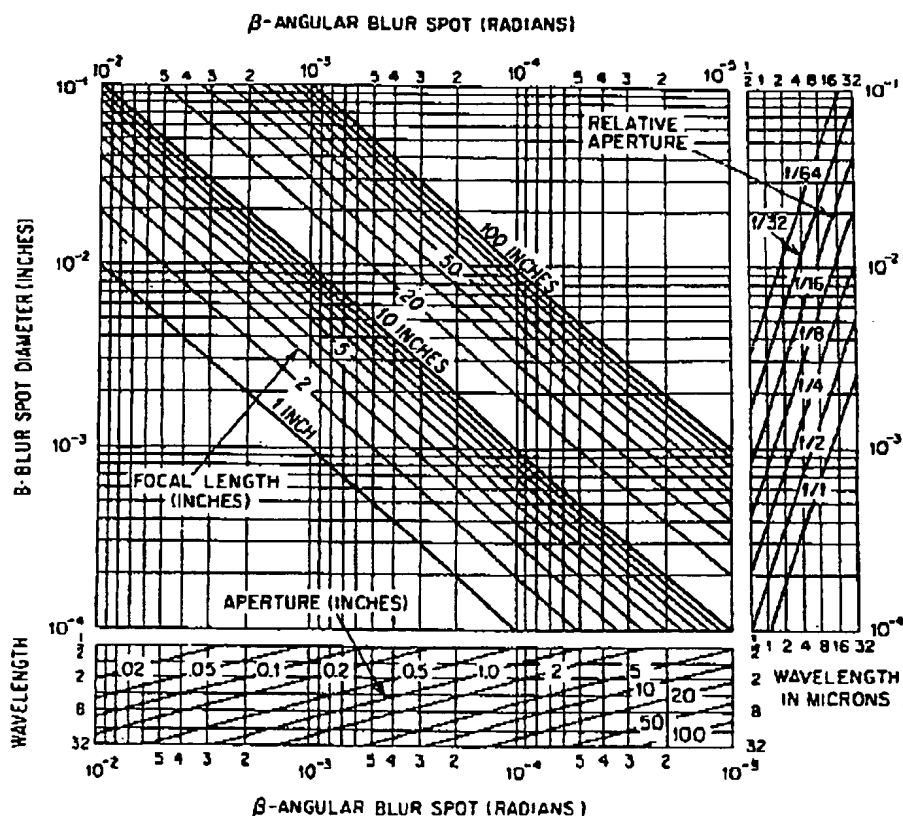

FIGURE 41 Estimation of the spot diameter for a diffraction-limited lens system. The diameter is that of the first dark ring of the Airy disk. (*Smith*, Modern Optical Engineering. *McGraw-Hill, New York, 1990, p. 458.*)

1.5 F-NUMBER AND NUMERICAL APERTURE

The focal ratio or F-number (FN) of a lens is defined as the effective focal length divided by the entrance pupil diameter D_{ep}. When the object is not located at infinity, the effective FN is given by

$$FN_{eff} = FN_\infty(1 - m) \tag{12}$$

where m is the magnification. For example, for a simple positive lens being used at unity magnification ($m = -1$), the $FN_{eff} = 2FN_\infty$. The *numerical aperture* of a lens is defined as

$$NA = n_i \sin U_i \tag{13}$$

where n_i is the refractive index in which the image lies and U_i is the slope angle of the marginal ray exiting the lens. If the lens is aplanatic, then

$$FN_{eff} = \frac{1}{2NA} \tag{14}$$

1.6 MAGNIFIER OR EYE LOUPE

The typical magnifying glass, or *loupe*, comprises a singlet lens and is used to produce an erect but virtual magnified image of an object. The magnifying power of the loupe is stated to be the ratio of the angular size of the image when viewed through the magnifier to the angular size without the magnifier. By using the thin-lens model of the human eye, the magnifying power (MP) can be shown to be given by

$$MP = \frac{25\ cm}{d_e + d_o - \phi d_e d_o} \tag{15}$$

where d_o is the distance from the object to the loupe, d_e is the separation of the loupe from the eye, and $\phi = 1/f$ is the power of the magnifier. When d_o is set to the focal length of the lens, the virtual image is placed at infinity and the magnifying power reduces to

$$MP = \frac{25\ cm}{f} \tag{16}$$

Should the virtual image be located at the near viewing distance of the eye (about 25 cm), then

$$MP = \frac{25\ cm}{f} + 1 \tag{17}$$

Typically simple magnifiers are difficult to make with magnifying powers greater than about 10×.

1.7 COMPOUND MICROSCOPES

For magnifying power greater than that of a simple magnifier, a compound microscope, which comprises an objective lens and an eyepiece, may be used. The objective forms an aerial image of the object at a distance s_{ot} from the rear focal point of the objective. The
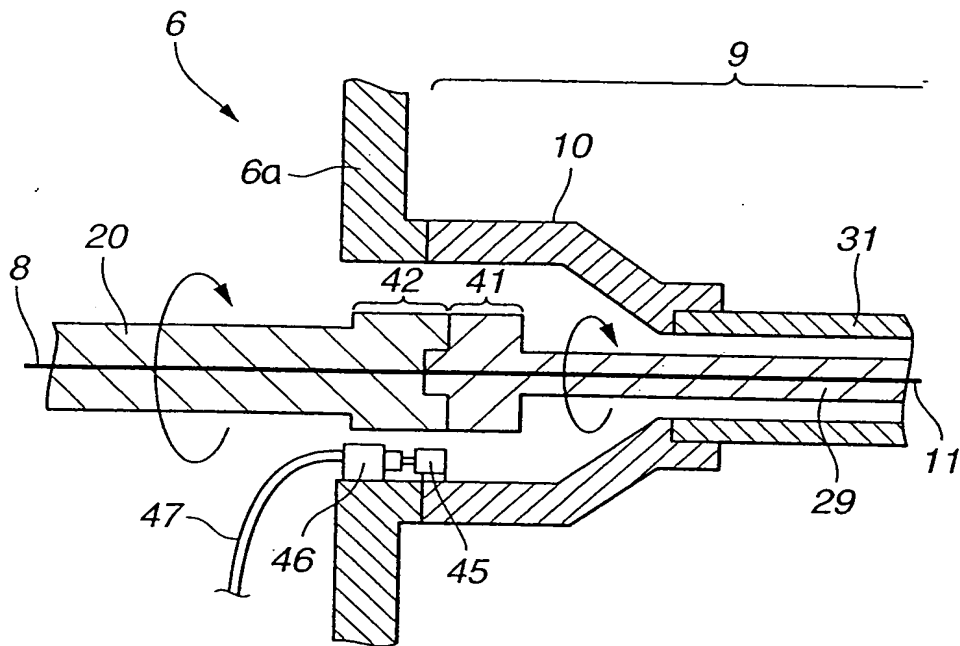
FIG.2

FIG.3